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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,464	01/21/2004	Paul Rich	WLJ.099	1392

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EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT	PAPER NUMBER
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1753

MAIL DATE	DELIVERY MODE
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09/24/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/760,464	RICH ET AL.	
	Examiner	Art Unit	
	Rodney G. McDonald	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Prosecution Reopened

Prosecution is reopened based on new rejections. The new rejections follow.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mohn et al. (EP 0 708 478) in view of Francis (U.S. Pat. 6,465,353).

Regarding claim 1, Mohn et al. teach an apparatus for processing a substrate including a chamber 10, a plasma creation element 12 for creating a plasma in a zone of the chamber and an electrostatic chuck for retaining a substrate 34 at a location in or adjacent to the zone such that an upper surface of the substrate 34 faces away from the

chuck. The apparatus further includes a shield 26 disposed on the zone side of the chuck overlying the peripheral portion of the upper surface of the substrate 34 at the location for preventing the presence of a plasma between the shield and the periphery portion of the upper surface of the substrate at the location whilst allowing processing of the substrate. (Column 3 lines 15-21; Column 4 lines 26-41; Column 5 lines 16-58; Column 6 lines 1-12)

Regarding claim 2, Mohn et al. teach that the shield is generally annular and circumjacent the chuck. (See Fig. 3)

Regarding claim 3, Mohn et al. teach that the shield can be electrically conducting since it can be made of SiC. (Column 3 lines 53)

Regarding claim 7, Mohn et al. teach a method of processing a substrate including electrostatically clamping the substrate to the chuck, creating a plasma adjacent the outwardly facing face of the clamped substrate, and locating a shield overlying the periphery of the outwardly facing face of the clamped substrate to prevent the presence of plasma between the shield and the periphery while processing the substrate. (Column 3 lines 15-21; Column 4 lines 26-41; Column 5 lines 16-58; Column 6 lines 1-12)

The differences between Mohn et al. and the present claims is that the plasma guard being a dark space shield is not discussed (Claims 1, 7) and the thickness of the substrate wafer is not discussed (Claims 1, 7, 8).

Regarding the plasma guard being a dark space shield (Claims 1, 7), The Examiner considers the plasma guard to be a dark space shield since the plasma guard

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does exactly what the claims require which is to prevent the presence of plasma between the shield and the periphery portion of the upper surface of the substrate.

(Column 3 lines 15-21)

Regarding the thickness of the wafer in claims 1, 7 and 8, Francis teach that semiconductor devices need thin wafers for processing. The thickness can be about 100 microns or less. (Column 1 lines 13-26, lines 39-60; Column 2 lines 38-42)

The motivation for utilizing the feature of Francis is that it allows processing wafers for semiconductor dies. (Column 1 lines 39-40)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Mohn et al. by utilizing the features of Francis because it allows for processing semiconductor wafer dies.

Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mohn et al. in view of Francis as applied to claims 1-3, 7 and 8 above, and further in view of Weichert et al. (U.S. PG PUB. 2003/0075522 A1).

The differences not yet discussed grounding the shield (Claim 4), connecting the chuck as a plasma creating element (Claim 5) and powering the chuck (Claim 6).

Regarding claim 4, Weichert et al. teach connecting a dark space shield 5b to ground. (Page 4 paragraph 0043)

Regarding claim 5, Weichert et al. teach that a chuck can also be a plasma creating element. (Page 4 paragraph 0042, paragraph 0043)

Regarding claim 6, Weichert et al. teach that a chuck can be powered. (Page 4 paragraph 0042, paragraph 0043)

The motivation for utilizing the features of Weichert et al. is that it allows for producing a high density plasma. (Paragraph 0011)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Weichert et al. because it allows for producing a high density plasma.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weichert et al. (US PG PUB 2003/0075522 A1) in view of Francis (U.S. Pat. 6,465,353) and Arnold et al. (U.S. Pat. 5,423,971) or Scherer (GB 2310433) or Mohn et al. (EP 0 708 478).

Regarding claim 1, Weichert et al. teach an apparatus for processing a substrate wafer including a chamber 1. (Page 4 paragraph 0044) A plasma creation element 2 for creating a plasma in a zone of the chamber. (Page 2 paragraph 0022) An electrostatic chuck for retaining a substrate at a substrate location in or adjacent to the zone. (Page 4 paragraph 0041) The apparatus includes a dark space shield 5b circumjacent the periphery of the location for preventing the presence of the plasma between the shield and the periphery of a substrate in the location whilst allowing processing of the substrate. (Page 4 paragraph 0041; paragraph 0043)

Regarding claim 2, Weichert et al. describes the shield 5b as generally annular. (Page 4 paragraph 0041)

Regarding claim 3, Weichert et al. describe the shield 5b as electrically conducting. (Page 4 paragraph 0041, paragraph 0043)

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Regarding claim 4, Weichart et al. teach that the shield 5b is grounded. (Page 4 paragraph 0043)

Regarding claim 5, Weichart et al. teach that the chuck is also a plasma creating element. (Page 4 paragraph 0042, paragraph 0043)

Regarding claim 6, Weichart et al. teach that the chuck is powered. (Page 4 paragraph 0042, paragraph 0043)

Regarding claim 7, Weichart et al. teach a method for processing a wafer. (Page 4 paragraph 0046) Including electrostatically clamping the substrate to the chuck. (Page 4 paragraph 0041) Creating a plasma adjacent to the outwardly facing face of the clamped substrate and locating a dark space shield between the plasma and the periphery of the substrate to prevent the presence of plasma between the shield and the periphery whilst allowing processing of the substrate. (Page 2 paragraph 0022; Page 4 paragraph 0045)

The differences between Weichart et al. and the present claims is that the thickness of the wafer substrate is not discussed (Claims 1, 7 and 8) and the dark space shield overlying a peripheral portion of the upper surface of the substrate is not discussed (Claims 1, 7)

Regarding the thickness of the wafer in claims 1, 7 and 8, Francis teach that semiconductor devices need thin wafers for processing. The thickness can be about 100 microns or less. (Column 1 lines 13-26, lines 39-60; Column 2 lines 38-42)

The motivation for utilizing the feature of Francis is that it allows processing wafers for semiconductor dies. (Column 1 lines 39-40)

Regarding claims 1, 7, Arnold et al. teach that a dark space shield should overlie a periphery of the substrate 17. (See Abstract; Fig. 1) Scherer teach locating a dark space shield (i.e. 6 coupled to 14) overlying a periphery of the substrate. (See Abstract; Figure) Mohn et al. teach that a dark space shield 26 should overlie a periphery of the substrate. (See Mohn et al. discussed above)

The motivation for utilizing the features of Arnold et al. is that it allows for preventing formation of parasitic plasmas. (See Abstract)

The motivation for utilizing the features of Scherer is that it allows for inhibiting defects in the film. (Page 2 para. 2, 3)

The motivation for utilizing the features Mohn et al. is that it allows for preventing plasma to effect the electrostatic chuck. (Page 3 lines 15-21)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Weichart et al. by utilizing the feature of Francis and Arnold et al. or Scherer or Mohn et al. because it allows for processing wafers for semiconductor dies and preventing formation of parasitic plasmas, inhibiting defects in the films and preventing damage to the electrostatic chuck.

Response to Arguments

Applicant's arguments filed September 7, 2007 have been fully considered. Applicant is correct in pointing out that Weichart (US2006/0108231) fails to qualify as prior art under 35 U.S.C. 102 (e). However the Examiner has applied references in the new 35 U.S.C. 103 rejections, which is believed to teach Applicant's claimed limitations. As such the arguments are addressed below.

In response to Applicant's argument that Weichart et al. does not teach a shield overlying a peripheral portion of an upper surface of the substrate during processing of the substrate, it is argued that newly cited references to Arnold et al., Scherer and Mohn et al. teach providing a dark space shield overlying a periphery of the substrate. The dark space shield prevents plasma from entering in the space between the shield and the wafer. It should be noted that Mohn et al.'s plasma shield ring is considered by the Examiner to be a dark space shield since the plasma guard does exactly what the claims require which is to prevent the presence of plasma between the shield and the periphery portion of the upper surface of the substrate. (See Arnold et al., Scherer and Mohn et al. discussed above)

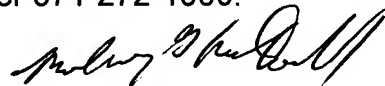
This action will be made NON-Final based on the new rejections.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-TH with every Friday off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
September 20, 2007